

CERTIFICATION UNDER 37 CFR 1.10

I hereby certify that this Transmittal Letter and the papers indicated as being transmitted therewith are being deposited with the United States Postal Service on this date shown below in an envelope as "Express Mail Post Office to Addressee" under the below indicated Mailing Label Number, addressed to: Box PCT, Assistant Commissioner for Patents, Washington, D.C. 20231.

Mailing Label No.: EF297166955US

Deposit Date: 6-21-01

Name: Diane M. Hixson

ATTORNEY'S DOCKET No. DYOUP0215US

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(DO/EO/US)**

In re national phase of:

Applicant(s): David Horne
International Application No.: PCT/GB99/04394
International Filing Date: December 23, 1999
Priority Date Claimed: December 30, 1998
Title of Invention: AN ELECTRICAL CABINET AND A FRAME
THEREFOR

**TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED
OFFICE (DO/EO/US) CONCERNING ENTRY INTO U.S. NATIONAL
PHASE UNDER 35 U.S.C. 371**

Box PCT
Assistant Commissioner for Patents
Washington D.C. 20231

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information under 35 U.S.C. 371:

1. This express request to immediately begin national examination procedures (35 U.S.C. 371(f)).
2. The U.S. National Fee (35 U.S.C. 371(c)(1)) and other fees (37 CFR 1.492) as indicated below.

3. A copy of the International application (35 U.S.C. 371(c)(2)):
- a. ☒ is transmitted herewith
(International Publication No. WO 00/41283).
 - b. ☐ is not required, as the application was filed with the United States Receiving Office.
 - c. ☐ has been transmitted by the International Bureau. A copy of Form PCT/1B/308 is enclosed.
4. ☐ A translation of the International application into the English language (35 U.S.C. 371(c)(2)) is transmitted herewith.
5. Amendments to the claims of the International application under PCT Article 19 (35 U.S.C. 371(c)(3)):
- a. ☐ are transmitted herewith.
 - b. ☐ have been transmitted by the International Bureau.
6. ☐ A translation of the amendments to the claims under PCT Article 19 (38 U.S.C. 371(c)(3)) is transmitted herewith.
7. A copy of the international examination report (PCT/IPEA/409)
- a. ☒ is transmitted herewith.
 - b. ☐ is not required as the United States Patent and Trademark Office was the IPEA.
8. Annex(es) to the international preliminary examination report
- a. ☒ is/are transmitted herewith.
 - b. ☐ is not required as the United States Patent and Trademark Office was the IPEA.
9. ☐ A translation of the annexes to the international preliminary examination report is transmitted herewith.

10. ☐ An oath or declaration of the inventor (35 U.S.C. 371(c)(4)) complying with 35 U.S.C. 115 is submitted herewith.
11. An International Search Report (PCT/ISA/210)
- a. ☒ is transmitted herewith.
- b. ☐ has been transmitted by the International Bureau.
- c. ☐ is not required, as the application was searched by the United States International Searching Authority.
12. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98 is transmitted herewith, along with Form PTO-1449 and copies of citations listed.
13. ☐ An assignment document is transmitted herewith for recording, along with a separate cover sheet.
14. ☒ A preliminary amendment is enclosed.
15. ☐ A verified statement claiming small entity status is enclosed.
16. ☐ Other:

Basic National Fee					Fee
IPEA - US					\$690.00
ISA - US					\$710.00
PTO not ISA or IPEA					\$1,000.00
Claims meet PCT Art. 33(1)-(4) - IPEA - US					\$100.00
Filing with EPO or JPO search report					\$860.00
Enter appropriate basic fee →					\$860.00
Claims*	Number filed		Number extra	Rate	
Total claims	9	-20	0	\$18.00	\$0.00
Independent claims	1	-3	0	\$80.00	\$0.00
Multiple dependent claims (if applicable)					\$270.00
Total of above					\$860.00
Small entity statement enclosed, 1 if Yes, 0 if No →				0	\$0.00
Total national fee					\$860.00
Fee for recording enclosed assignment				\$40.00	
Total fees enclosed					\$860.00

*After any attached preliminary amendment reducing the number of claims and/or deleting multiple dependencies.

☒ A check in the amount of \$ 860.00 to cover the above fees is enclosed.

☐ Please charge our Deposit Account No. 18-0988 in the amount of \$ _____. A duplicate copy of this sheet is enclosed.

WARNING: TO AVOID ABANDONMENT OF THE APPLICATION THE BASIC NATIONAL FEE MUST BE PAID WITHIN THE 20/30 MONTH TIME LIMIT.

16. The Commissioner is hereby authorized to charge the following additional fees that may be required by this paper and during the entire pendency of this application to our Deposit Account No. 18-0988:

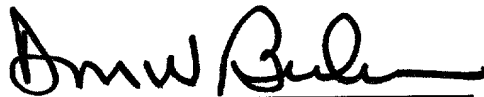
a. ☒ 37 CFR 1.492(a)(1), (2), (3), (4) and (5) (filing fees)

WARNING: BECAUSE FAILURE TO PAY THE NATIONAL FEE WITHIN 30 MONTHS WITHOUT EXTENSION (37 CFR S 1.495(B)(2)) RESULTS IN ABANDONMENT OF THE APPLICATION, IT WOULD BE BEST TO ALWAYS CHECK THE ABOVE BOX.

b. ☐ 37 CFR 1.492(b), (c) and (d) (presentation of extra claims)

NOTE: Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 CFR 1.492(d)), it might be best not to authorize the PTO to charge additional claim fees, except possibly when dealing with amendments after final action.

Respectfully submitted,



Don W. Bulson, Reg. No. 28,192

Direct all correspondence and telephone calls to:

Don W. Bulson, Esq.
RENNER, OTTO, BOISSELLE & SKLAR, LLP
1621 Euclid Avenue, 19th Floor
Cleveland, Ohio 44115
Tel: 216-621-1113 Fax: 216-621-6165
Internet: dbulson@rennerotto.com

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT application of:

Applicant: David Horne

Appln. No.:

Filing Date:

Title: AN ELECTRICAL CABINET AND A FRAME THEREFOR

Grp./Art Unit:

Examiner:

Docket No.: DYOUP0215US

PRELIMINARY AMENDMENT DELETING MULTIPLE DEPENDENCIES

Box PCT

Assistant Commissioner for Patents

Washington, D.C. 20231

Sir:

Further and favorable consideration of the above-referenced application is respectfully requested in view of the following amendments and remarks.

Amendments

Please amend the application in the below indicated manner.¹ The Commissioner is hereby authorized to charge any extra claim fees to Deposit Account No. 18-0988 under the above set forth Docket No.

In the Claims:

Please amend claims 3, 5, 7-9 as follows:

3. (Amended) A frame for an electrical cabinet according to claim 1, comprising four side members (20).

¹ The change(s) to the specification and/or claims are shown by underscoring and bracketing in the marked-up version attached hereto as an Appendix.

5. (Amended) An electrical cabinet, comprising a frame (10) according to claim 1, and removable side panels (40).

7. (Amended) An electrical cabinet according to claim 5, further comprising at least one removable end panel (50).

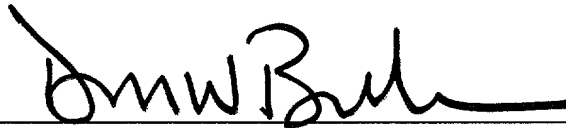
8. (Amended) An electrical cabinet according to claim 5, wherein the removable side panels (40) and/or the at least one removable door (60) are removably attached to the side members (20) of the frame (10) by hooks.

9. (Amended) An electrical cabinet according to claim 5 wherein the removable side panels (40) are mounted on cantilevers extending out from the frame (10).

Remarks

This amendment is being submitted to delete all multiple dependencies from the claims prior to calculation of the filing fee.

Respectfully submitted,



Don W. Bulson
Reg. No. 28,192

RENNER, OTTO, BOISSELLE & SKLAR, LLP
1621 Euclid Avenue, 19th Floor
Cleveland, Ohio 44115

Tel: (216) 621-1113
Fax: (216) 621-6165
Email: DBulson@RennerOtto.com

CERTIFICATION UNDER 37 CFR 1.10

I hereby certify that this Transmittal Letter and the papers indicated as being transmitted therewith are being deposited with the United States Postal Service on this date shown below in an envelope as "Express Mail Post Office to Addressee" under the below indicated Mailing Label Number, addressed to: Box PCT, Assistant Commissioner for Patents, Washington, D.C. 20231.

Mailing Label No.: EF297166955US

Deposit Date: 6-21-01

Name: Diane M. Hixson

APPENDIX

The change(s) to the specification and/or claims are below shown by underscoring and bracketing.

In the Claims:

Claims 3, 5, 7-9 has been amended as follows:

3. (Amended) A frame for an electrical cabinet according to claim 1 [or 2], comprising four side members (20).

5. (Amended) An electrical cabinet, comprising a frame (10) according to [any of the preceding claims] claim 1, and removable side panels (40).

7. (Amended) An electrical cabinet according to claim 5 [or 6], further comprising at least one removable end panel (50).

8. (Amended) An electrical cabinet according to [any of claims 5 to 7] claim 5, wherein the removable side panels (40) and/or the at least one removable door (60) are removably attached to the side members (20) of the frame (10) by hooks.

9. (Amended) An electrical cabinet according to [any of claims 5 to 8] claim 5 wherein the removable side panels (40) are mounted on cantilevers extending out from the frame (10).

PTO/PCT Rec'd 21 JUN 2001
AN ELECTRICAL CABINET AND A FRAME THEREFOR

This invention relates to frames for electrical cabinets and to electrical cabinets.

Electrical cabinets for receiving electronic and electrical components, are used in connection, for example, with the operation of local data networks. The components, for example, subracks with electronic and electrical components, fans and other accessories are mounted within the cabinets on internal frames. The cabinets generally have side panels, a door and end panels that surround and are mounted on the frame.

These electrical cabinets require access for cables, which are often thick and unwieldy, and also for people to service the appliances. Conventional frames have substantial die-cast end members. One frame of the prior art is designed with end members that have recesses in the sides, these recesses can be used for cable access so that, with the side panels of the cabinet removed, cables do not need to be threaded through access holes. Despite the advantages of side recesses these end members are nevertheless, bulky, expensive to manufacture and the space for the cables is limited.

According to one aspect of the invention there is provided a frame of an electrical cabinet, said frame comprising:

two transverse members disposed at opposite ends of the frame and connected together by at least two side members, each of the transverse member having a skeletal form comprising at least one tube and/or bar with at least one side of each transverse member having a recess in a substantial part of said at least one side.

The device of the present invention overcomes or at least alleviates the problems of the prior art by providing transverse members which are skeletal in form, making them cheap to manufacture. The skeletal form also provides for large recesses which allow good cable access and also enable service personnel to place their feet inside the cabinet giving them better access to the electronic equipment they are servicing. Thus the present invention can provide a frame for an electrical cabinet with improved performance and at approximately two thirds of the price of the frames of the prior art.

Advantageously, the frame has four of the side members. The provision of four side members and transverse members at either end of the frame can provide a robust construction for the frame.

In preferred embodiments, the transverse member is formed from two bars or tubes connected together. Advantageously, these two bars or tubes have the same shape and are

connected at and around points half way along their respective lengths. The use of bars or tubes having substantially the same shape reduces manufacturing costs.

The tubes or bars may, advantageously, be substantially "U" shaped and may be connected together at the bases of the two "U"s. This provides a robust shape from a small amount of material. It also provides large recesses in the sides which are convenient for cable and personnel access.

In some embodiments, the base of the "U" shaped bars or tubes are substantially straight. This arrangement allows for the two bars to be more easily and robustly joined together. This is particularly so if they are welded or brazed together. Welding and brazing provide a convenient, strong and cost effective way of joining the two components.

In an alternative embodiment, the bars or tubes are joined to form a substantially cross shape, preferably an elongate cross shape wherein the end portions of one side of said elongate cross is parallel to the other side. This arrangement also provides for large side recesses.

In some embodiments, the transverse member may comprise further strengthening bars or tubes connected to both of said two tubes or bars.

According to another aspect of the invention, there is provided an electrical cabinet comprising a frame as described above and further comprising removable side panels, end panels and/or doors. Electrical cabinets may require the various components to be interchanged or serviced and therefore the provision of side and end panels that are easily removable is very convenient. Although these panels and doors may be screwed on, in preferred embodiments they are attached to the frame by hooks thereby facilitating their removal.

Although the side panels may be mounted directly to the frame, in some embodiments they are mounted on cantilevers extending out from the frame. This arrangement allows for extra space at the sides of the cabinet.

Embodiments of the present invention will now be described, by way of example only, and with reference to the accompanying drawings, in which:

Figure 1 illustrates a frame according to an embodiment of the present invention;

Figure 2 illustrates the frame of Figure 1 with associated side and end panels and a quick-release door;

Figure 3 illustrates a portion of an electrical cabinet according to another embodiment of the present invention;

Figure 4 illustrates a transverse member for a frame according to an embodiment of the present invention.

Figure 1 illustrates a frame according to an embodiment of the present invention. The frame 10 comprises tubular side members 20, connected together by two tubular transverse members 30 at either end of the side members. The tubular transverse members comprise two straight based "U" shaped tubes 32, 34 welded together. Although in preferred embodiments the transverse member is comprised of tubular members welded together it may alternatively be formed of bars, and the two pieces may be crimped or screwed together.

Figure 2, illustrates side panels 40, an end panel 50 and a removable door 60 that are mounted on the frame of Figure 1 to form an electrical cabinet. The removable door is mounted via hooks 62 in holes (not shown) on the side members 20 of the frame 10, thereby forming a quick-release fitting. The end panel 50, has a ventilation hole 52, and cable access recesses 54. Electrical cabinets typically have a width of 19" (approximately 48cm). They are often mounted on wheels (not shown) for ease of movement.

Figure 3 illustrates a view of a portion of an electrical cabinet 70 according to an embodiment of the present invention. This electrical cabinet 70 has no end member. Electrical cabinets that are the same height as the room in which they are located, with cabling coming down from the ceiling, are often used, such electrical cabinets generally have no end members. In this embodiment the side panels 40 have ventilation holes. The side members 20 of the end frame comprise holes 22 which receive hooks attached to elements to be mounted in the electrical cabinet.

Figure 4, illustrates an alternative embodiment of the transverse member 30 of the frame. This member is formed of two main bars or tubular members 36 welded together to form an elongate cross shape. Additional strengthening bars or tubes 38 may be used to support the structure. Although it is preferred to weld or braze the two portions together they may also be attached by crimping, or by screw attachments.

CLAIMS

1. A frame (10) for an electrical cabinet, the frame (10) comprising two transverse members (30) disposed at opposite ends of the frame (10), and at least two side members (20) connecting opposed sides of the transverse members (30), wherein each of the transverse members (30) has a skeletal form formed from two connected substantially "U" shaped bars (32, 34) having substantially the same shape with substantially straight bases, and being connected together at the bases thereof by welding or brazing, with at least one of the other sides of each of the transverse members (30) having a recess in a substantial part thereof, and the side members (20) being stepped back from the other sides of the transverse members (30) to define a space therebetween.
2. A frame for an electrical cabinet according to claim 1, wherein each of the transverse members (30) includes additional bars or tubes (38) connected as strengthening members to the two bars or tubes (36).
3. A frame for an electrical cabinet according to claim 1 or 2, comprising four side members (20).
4. A frame for an electrical cabinet according to claim 3, wherein the four side members (20) comprise four bars or tubes.
5. An electrical cabinet, comprising a frame (10) according to any of the preceding claims, and removable side panels (40).

AMENDED SHEET

6. An electrical cabinet according to claim 5, further comprising at least one removable door (60).
7. An electrical cabinet according to claim 5 or 6, further comprising at least one removable end panel (50).
- 5
8. An electrical cabinet according to any of claims 5 to 7, wherein the removable side panels (40) and/or the at least one removable door (60) are removably attached to the side members (20) of the frame (10) by hooks.
- 10
9. An electrical cabinet according to any of claims 5 to 8 wherein the removable side panels (40) are mounted on cantilevers extending out from the frame (10).

AMENDED SHEET

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : H02B 1/30		A1	(11) International Publication Number: WO 00/41283
			(43) International Publication Date: 13 July 2000 (13.07.00)
(21) International Application Number: PCT/GB99/04394		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).	
(22) International Filing Date: 23 December 1999 (23.12.99)			
(30) Priority Data: 9828843.4 30 December 1998 (30.12.98) GB			
(71) Applicant (for all designated States except US): APW ELECTRONICS LIMITED [GB/GB]; Electron Way, Chandlers Ford, Eastleigh, Hampshire SO53 4ZR (GB).			
(72) Inventor; and			
(75) Inventor/Applicant (for US only): HORNE, David [GB/GB]; 11 Pine Close, South Wonston, Hampshire SO21 3EB (GB).		Published With international search report.	
(74) Agent: PURVIS, William, Michael, Cameron; D. Young & Co., 21 New Fetter Lane, London EC4A 1DA (GB).			

(54) Title: AN ELECTRICAL CABINET AND A FRAME THEREFOR

(57) Abstract

An electrical cabinet (70) and a frame (10) therefor, wherein the frame comprises side members (20) connected together by transverse members (30). Each transverse member (30) is made from bars or tubes in a skeletal form with at least one recess in the side of the transverse member (30). The skeletal form of each transverse member (30) makes it cheap to manufacture and can provide for large recesses, thereby facilitating cable access. The electrical cabinet (70) comprises removable side panels (40) and a door (60) mounted on the frame (10). The frame (10) can also provide mounting points for subracks of electrical or electronic components.

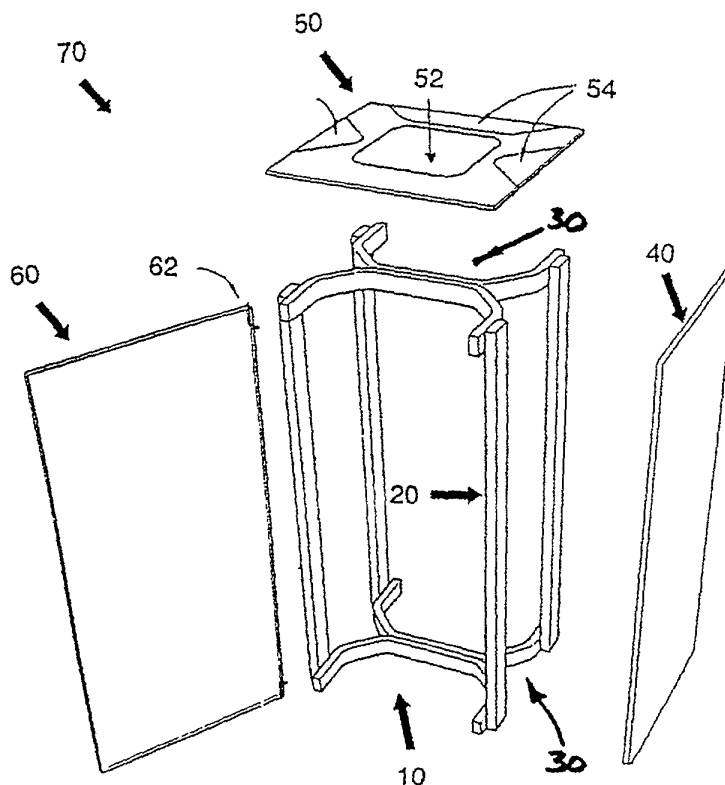


FIGURE 1

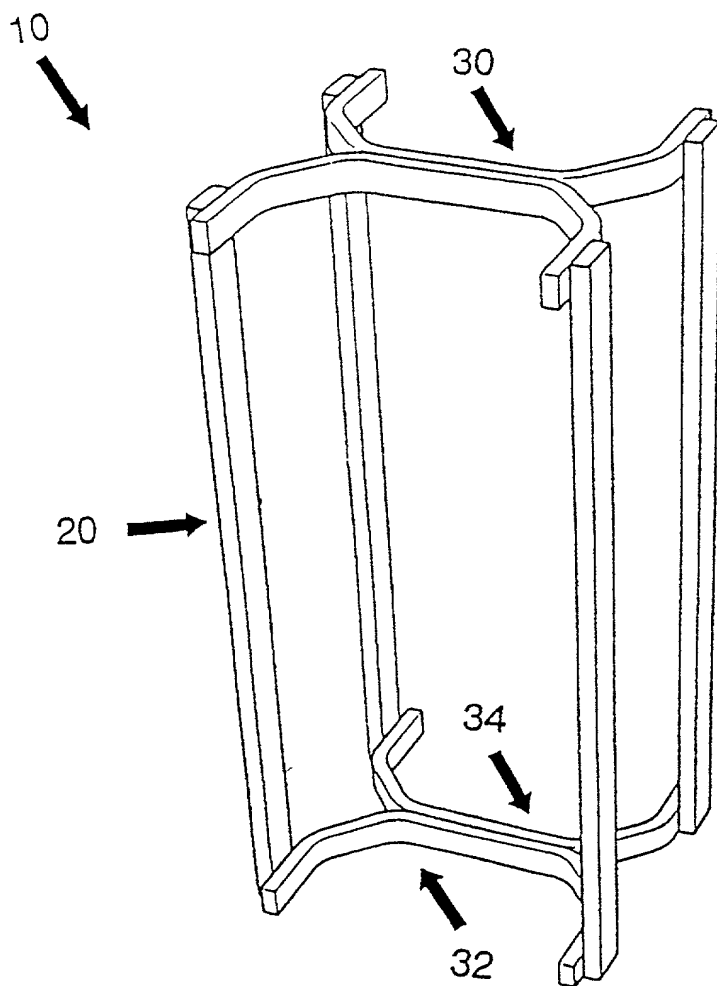


FIGURE 2

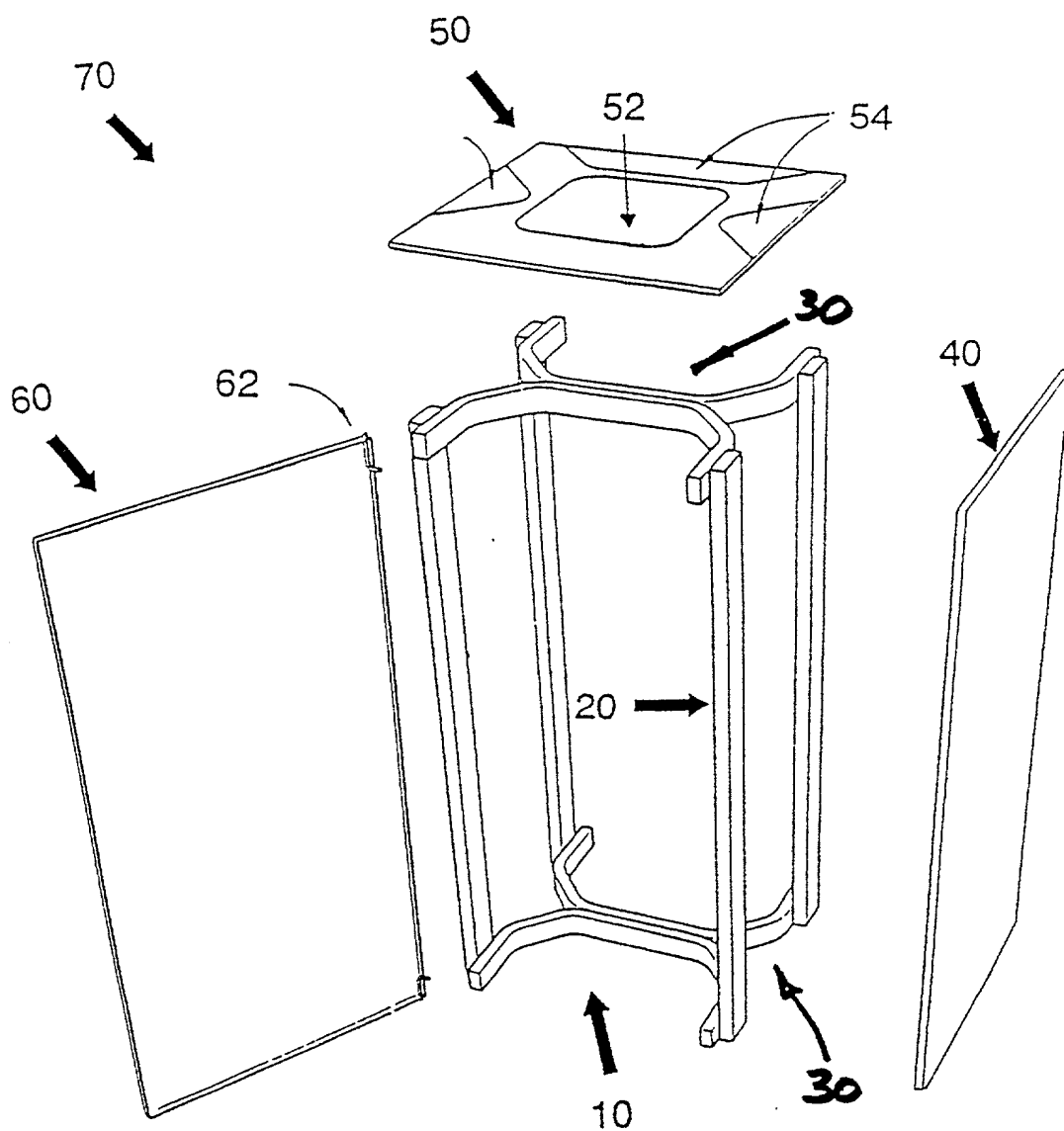


FIGURE 3

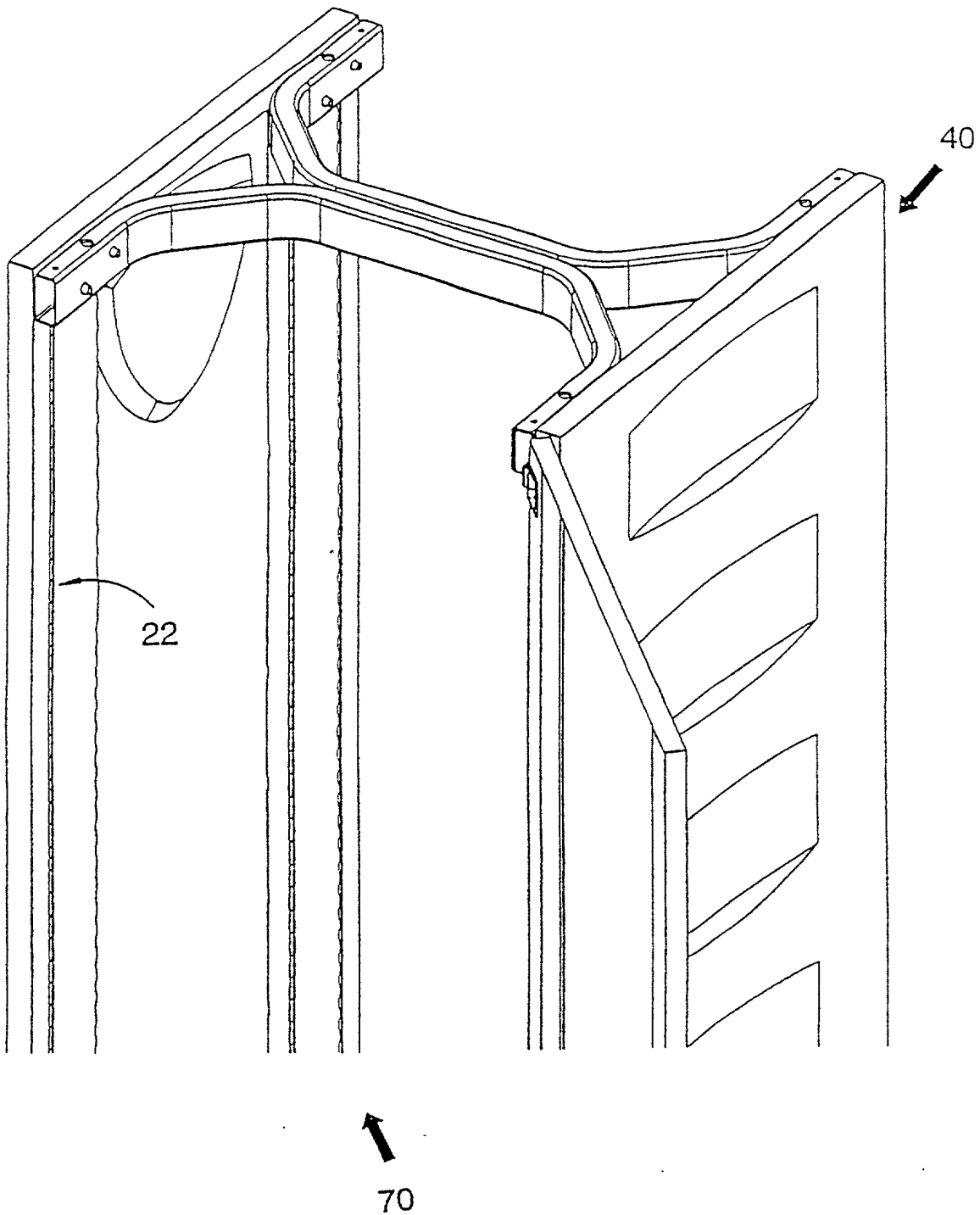
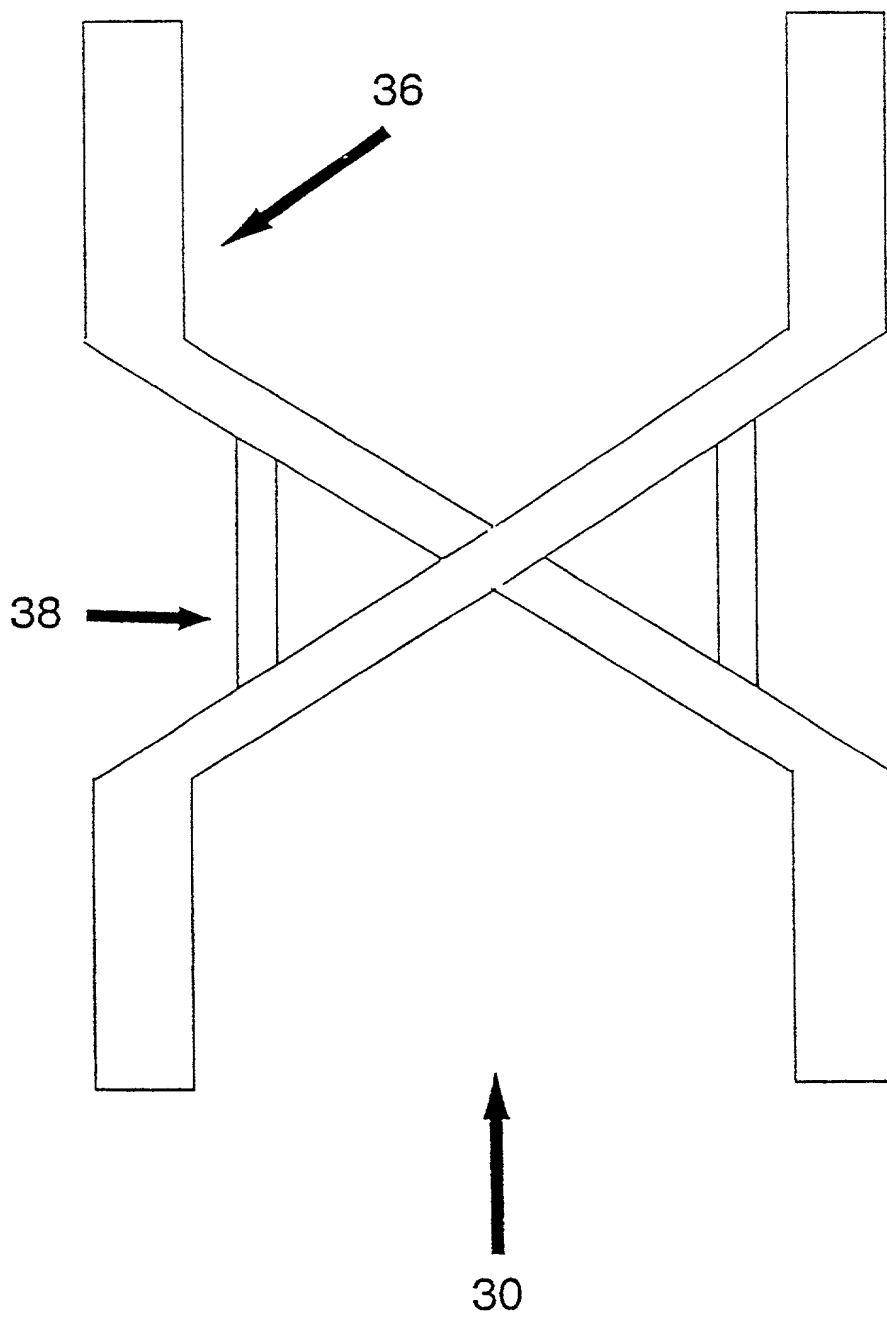


FIGURE 4



Attorney Docket No. DYOUP0215US

PATENT (OUS)

COMBINED DECLARATION AND POWER OF ATTORNEY
(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT)

As a below named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name; and I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Title: **AN ELECTRICAL CABINET AND A FRAME THEREFOR**

the specification of which

☐ is attached hereto, or

☒ was filed as United States Application No.: 09/868,781
Application or PCT International (Express Mail Label No.)
Application (give Express Mail label Filing Date: June 21, 2001
number and deposit date if (Deposit Date)
Application number not yet known): Amended on (if applicable):

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations §1.56(a).

PRIORITY CLAIM

I hereby claim priority benefits under Title 35, United States Code, §119 of (i) any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed; and (ii) any United States provisional application(s) that is/are listed below.

☐ no such applications have been filed.
☒ such applications have been filed as follows.

EARLIEST FOREIGN/PROVISIONAL APPLICATION(S), IF ANY FILED WITHIN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION

COUNTRY	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED	
			Yes	No
GB	9828843.4	30 December 1998	X	

ALL FOREIGN APPLICATION(S), IF ANY FILED MORE THAN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION

POWER OF ATTORNEY

As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration number)

3 ✓ Armand P. Boisselle, Reg. No. 22,381; Warren A. Sklar, Reg. No. 26,373; Don W. Bulson, Reg. No. 28,192

The undersigned to this declaration and power of attorney hereby authorizes the U.S. attorney(s) named herein to accept and follow instructions from

Authorized representative: D. Young & Co., Briton House, Briton Street, Southampton SO14 3EB, UNITED KINGDOM

as to any actions to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney(s) and the undersigned. In the event of a change in the person(s) from whom instructions may be taken, the U.S. attorney(s) will be so notified by the undersigned.

Send Correspondence To

Don W. Bulson, Esq.
Renner, Otto, Boisselle & Sklar, LLP
1621 Euclid Ave., 19th Floor
Cleveland, Ohio 44115

Direct Telephone Calls To:

(name and telephone number)

Don W. Bulson
(216) 621-1113

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Sole or First Inventor: David Horne			
Inventor's signature:	<i>[Signature]</i>	Date:	7/03/02
Residence: (City & State/Country):	Same as Post Office Address	Citizenship:	United Kingdom
Post Office Address:	11 Pine Close South Wonston Hampshire SO21 3EB UNITED KINGDOM <i>GBX</i>		

Full Name of Additional Joint Inventor (if any):			
Inventor's signature:		Date:	
Residence: (City & State/Country):		Citizenship:	
Post Office Address:			

CHECK FOR ANY OF THE FOLLOWING ADDED PAGE(S) WHICH FORM A PART OF THIS DECLARATION

- ☐ Signature for additional joint inventors.
- ☐ Added page to combined declaration and power of attorney for divisional, continuation, or continuation-in-part (CIP) application.
- ☒ This declaration ends with this page.